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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/038,297	01/04/2002	Brigitte Chau Phan	BTI2 00103501(USP2)US	8429

20995 7590 04/05/2005

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EXAMINER	
LUM, LEON YUN BON	

ART UNIT	PAPER NUMBER
1641	

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/038,297	PHAN ET AL.	
	Examiner	Art Unit	
	Leon Y. Lum	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 January 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,5-9 and 11-20* is/are pending in the application.

4a) Of the above claim(s) *11-20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 5-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 January 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The amendment filed 10 January 2005 is acknowledged and has been entered.

Drawings

2. The drawings were received on 10 January 2005. These drawings are acceptable.

Election/Restrictions

3. Newly submitted claims 11-20 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Claims 1 and 5-9 constitute a group that have different modes of operation and different functions from claims 11-20, and a requirement for restriction between claims 1 and 5-9, and claims 11-20 would have been made if claims 11-20 were originally presented. Specifically, claims 1 and 5-9 are directed towards a method with the limitations of determining the amount of probe or capture agent bound to the test solid phase non-covalently, and calculating the percentage of probe bound covalently to the test solid phase, which are not limitations in claims 11-20. In addition, claims 11-20 are directed towards a method with the limitations of a first binding reaction comprising a cross-linking agent and a second binding reaction that lacks a cross-linking reaction, which are not limitations in

claims 1 and 5-9. Therefore, claims 1 and 5-9, and claims 11-20 have different modes of operation and different functions that distinguish them as unrelated inventions.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 11-20 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1 and 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sutton et al (US 5,147,777) in view of Gustafson et al (US 5,413,939).

In the instant claims, Sutton et al reference teaches the preparation of several reagents having a radio-labeled protein (i.e. probe or capture agent) attached to polymeric particles (i.e. binding a probe to a test solid phase), wherein the polymeric particles include Poly(styrene-co-monomethacryloylpenta(oxyethylene) glutarate), and wherein the protein is ^{3}H labeled bovine gamma globulin. See column 18, line 55 to column 19, line 16. In addition, Sutton et al reference teaches the steps of determining the total amount of ^{3}H labeled bovine gamma globulin bound to the particles, the amount of ^{3}H labeled bovine gamma globulin covalently bound to the particles (i.e. determining the amount of probe or capture agent bound covalently to the test solid phase), and the covalent/total bound ratio (i.e. determining the amount of probe or capture agent bound to the test solid phase non-covalently; calculating the percentage

of probe or capture agent bound covalently to the test solid phase), and wherein results show that the reagents prepared, including Poly(styrene-co-monomethacryloylpenta(oxyethylene) glutarate) which had 90% of the protein covalently bound, acceptably bind antibody for use in immunoassays (i.e. if no less than approximately 80% of the probe or capture agent is bound covalently, the test solid phase is a suitable surface). See column 19, lines 5-6 and 54-60; and Table I (Test C).

However, Sutton et al reference fails to teach that the test solid phase is a biodisc surface.

Gustafson et al reference teaches a rotating disc (i.e. biodisc) with an active binding reagent region, in order to measure analytes using a system that does not require labeling and has improved sensitivity. See column 2, lines 10-24 and 39-57. In addition, Gustafson et al reference teaches that the analyte is a member of a naturally-occurring binding pair and that the anti-analyte is covalently or non-covalently bound to the surface of the disk. See column 4, lines 3-9 and 21-25.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Sutton et al with a rotating disc (i.e. biodisc) with an active binding reagent region, as taught by Gustafson et al, in order to measure analytes using a system that does not require labeling and has improved sensitivity. One of ordinary skill in the art at the time of the invention would have had reasonable expectation of success in including a rotating disc, as taught by Gustafson et al, in the method of Sutton et al, since both references teach immobilization of a biological material both covalently and non-covalently to a insoluble substrate.

With regards to claims 5-7, Sutton et al reference teaches that the reagents have one or more biologically active substance covalently attached to the polymeric particles through the reactive carboxy groups on the outer surface of the particles, wherein the biologically active substance can be nucleic acids, wherein the nucleic acid is double-stranded (i.e. double stranded nucleic acid), and wherein the biologically active substance can be proteins (i.e. protein). See column 8, lines 19-22 and lines 36-54, particularly lines 40-42 and 49-50.

With regards to claim 8, Sutton et al reference teaches a tetraethylene glycol amine linker (i.e. linker) attached to β-globin DNA. See column 21, lines 9-25.

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sutton et al (US 5,147,777) in view of Gustafson et al (US 5,413,939), as applied to claims 1 and 9 above, and further in view of Heinonen et al (US 5,912,342).

Sutton et al and Gustafson et al references have been disclosed above and Sutton et al additionally teaches that the copolymers produced are latex particles. See column 5, lines 9-11. However, Sutton et al and Gustafson et al fail to disclose that the linker is at least one polyethylene glycol moiety.

Heinonen et al reference teaches that polyethylene glycol can be grafted onto materials such as polystyrene, in order to react with various types of organic molecules to form covalent linkage and to bind covalently chemical compounds. See column 3, lines 63-67 and column 4, lines 1-4.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Sutton et al, with polyethylene glycol that can be grafted onto materials such as polystyrene, as taught by Heinonen et al, in order to react with various types of organic molecules to form covalent linkage and to bind covalently chemical compounds. One of ordinary skill in the art at the time of the invention would have reasonable expectation of success in using the polyethylene glycol, as taught by Heinonen et al, in the method of Sutton et al, since Sutton et al teach latex substrates, and the polyethylene glycol taught by Heinonen et al can be grafted on polystyrene, which is a type of latex, for covalent binding of molecules.

Response to Arguments

9. The following remarks and statements concern Applicant's arguments filed 10 January 2005.

10. On page 6, with respect to claim 1, Applicants contend that the term "approximately" is clear and definite and does not raise any different issues than the well-accepted term "substantially". The Examiner therefore withdraws the 35 U.S.C. 112, 2nd paragraph rejection of the term "approximately" in claim 1.

11. On page 7, with respect to claim 1, Applicants contend that Sutton et al reference does not disclose obtaining a biodisc, wherein at least one surface of the biodisc

comprises a test solid phase. Since the claimed limitation of a "at least one surface of the biodisc comprises a test solid phase" has been added as part of an amendment to the claims and was not in the original claims as filed, Applicants argument is moot in view of the 35 U.S.C. 103(a) rejection of claim 1 supra.

12. On pages 7-8, with respect to claims 11-20, Applicants arguments are moot since the claims were submitted to amend the claim listing and are directed towards an unrelated invention, and the invention has been elected by original presentation as explained in the Election/Restriction section supra.

13. On pages 8-10, with respect to claims 4 and 10, Applicants state that the limitations of claims 4 are directed to a biodisc have been placed in independent claim 1 and contend that amended claim 1 is not obvious over Sutton et al in view of Gustafson et al. Specifically, Applicants argue that "there is no suggestion or motivation to modify the method of Sutton based on Gustafson" (page 9, last paragraph), that "it is clear from the reference [Gustafson] that the type of bonding forces used to attach the anti-analyte to the solid surface is unimportant to the author" (page 10, 1st paragraph), and that a "skilled artisan, having read both Gustafson and Sutton, would not be motivated to apply the methods disclosed in Sutton to the interferometer discs described in Gustafson because discs that include predominately non-covalently bound anti-analyte are considered suitable for the applications described in Gustafson" (page 10, 1st paragraph).

Applicant's arguments have been fully considered, but they are not persuasive. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Sutton et al reference has been applied to teach the limitations of covalent and non-covalently binding and an 80% covalently binding ratio thereof, between a probe or capture agent and test solid phase, by disclosing H^3 labeled bovine gamma globulin (i.e. probe or capture agent) bound to Poly(styrene-co-monomethacryloylpenta(oxyethylene) glutarate) (i.e. test solid phase). However, Sutton et al reference does not teach that the test solid phase is a biodisc surface. Gustafson et al reference is therefore applied to teach the remaining limitation by disclosing an interferometer (i.e. biodisc) with the proper motivation of providing a system that does not require labeling and has improved sensitivity. Gustafson et al reference is not applied to teach the types of bonding forces, as argued by Applicant, since Sutton et al already teaches these limitations. In addition, the motivation of a system that does not require labeling and has improved sensitivity is clearly a benefit since it reduces the number of steps needed to perform an assay and allows for more specific results, respectively. Furthermore, contrary to Applicant's arguments, there is reasonable expectation for success in combining Sutton et al and Gustafson et al reference since both references teach that biological molecules can bind to the substrates – either a particle or spinning disc – and both covalent and non-covalent binding can be performed on both systems. It is important that covalent and

non-covalent binding can be assessed in the Gustafson et al reference since Sutton et al reference requires determination of both types of binding in order to produce the ratio of total to covalent binding between the protein and substrate surface.

14. On page 10, with respect to claim 9, Applicants contend that the "combination of Sutton and Heinonen fails to teach all the limitations of Claim 9", wherein "Sutton does not teach or suggest measuring the amount of probe that binds to a solid phase in the absence of a cross-linking agent" and "Likewise, Heinonen does not disclose this step" (page 10, 2nd paragraph).

Applicant's arguments have been fully considered, but they are not persuasive. Claim 9, dependent on claim 8 and amended claim 1, recites "wherein the linker is at least one polyethylene glycol moiety". Since the claimed limitation is directed only to a "linker", it is unclear and confusing as to why Applicants argued the point that neither Sutton et al or Heinonen et al references teach or suggest measuring a probe in the absence of a "cross-linking agent". Nowhere in claims 1 and 8-9 is there mention of a "cross-linking agent". Since Applicants have not argued the specifics of Sutton et al, Gustafson et al, or Heinonen et al with regards to the limitations of claim 9, Applicants arguments are not persuasive.

15. On page 10, Applicants request the withdrawal of the provisional obviousness-type double patenting rejection since the claims in the copending application upon

which the rejection was based are no longer presented for examination. The double patenting rejection is hereby withdrawn.

Conclusion

16. No claims are allowed.

17. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leon Y. Lum whose telephone number is (571) 272-2878. The examiner can normally be reached on weekdays from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571) 272-0823. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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